2008-2018 Long-Term Occupational projections Methodology Report

Introduction

Occupational and industry employment projections are useful sources of information for planning and preparation of educational and training programs, assessing the need for skilled workers in the future and studying long-range trends in occupational employment. Long-term projections are created every two years and cover a ten year time-span. Current projections cover the years 2008 – 2018. The 2008 – 2018 industry and occupation employment projections were funded by the U.S. Department of Labor's (DOL) Employment and Training Administration.

The creation of long-term projections consists of four principal phases:

1. **Creation of Industry Level Historical Employment Trends (time series)**

a. The projections employment measure is considered to be a "total employment" measure. Because of this, it is required that data be collected from several sources. The two principal sources the time series is created from combines the Quarterly Census of Employment and Wages (QCEW) data, which includes Kansas employment that is covered by unemployment insurance law, and Current Employment Statistics (CES) data for employment that is not covered by unemployment insurance law. This study uses annual data starting in 1990 and ending in 2008.

b. Another source of data covering self-employed and unpaid family workers (SE & UFW) comes from the U.S. DOL, Bureau of Labor Statistics (BLS). BLS provides ratios of employment for the base year (2008) and projected year (2018) which are applied to occupational level employment to determine a SE & UFW employment level. This employment level is added back to the appropriate occupation to obtain employment totals that include self-employed and unpaid family workers.

c. The time series data was also adjusted according to standardized procedures to align employment in certain three and four digit industries. The major employment alignments were school and hospital employment. State, local and federal government school and hospital employment was subtracted from government industries (92, 93 and 9991 respectively) and added to the Educational Services (61) and Health Care and Social Assistance (62) industries. These adjustments are meant to more closely align descriptive projection variables associated with each industry to give a more accurate projection for all industries. Also, postal service employment was subtracted from Federal Government employment and added to Transportation and Warehousing (48) for the same purpose.

d. This data is provided at the county level and then aggregated to create the State of Kansas and region projection information. Non-geographic identifiable employment, such as traveling salesmen, was summed and proportioned by industry to each region which more closely accounts for a "total employment" measure. The time series of employment is the foundation for industry employment projections.

2. **Projecting Industry Level Employment**

a. To develop industry employment projections for the State of Kansas and the sub state areas, the Kansas Department of Labor (KDOL) Labor Market Information Services (LMIS) utilizes the Long-

Term Industry Projection program. This program uses the time series data for employment and data for several other factors including national and local area trends in industry employment, population, personal income and the statewide economic outlook. An LMIS analyst then uses this information and the program with various types of linear, shift-share and Ordinary Least Square regression models to develop the projected year employment.

b. These initial projections are reviewed and adjusted using input from Kansas Department of Labor analysts and economists from state universities across Kansas.

3. Creation of Occupational Employment Within Industries (Staffing Pattern)

a. This phase is needed to collect and analyze the Occupational Employment Statistics (OES) program survey data from Kansas employers on how many individuals they employ in each occupation. The OES survey is semiannual and uses data from the past three years. For the 2008 – 2018 projections, survey panels from November 2006, May 2007, November 2007, May 2008, November 2008 and May 2009 were used. From this information a relationship between industry employment and occupational employment can be identified to create a staffing pattern.

b. Staffing patterns for industries not covered by the OES survey, or where information was confidential, were created from national staffing patterns. Federal Government staffing patterns were provided by BLS.

4. Projecting Occupational Level Employment

a. The final phase consists of applying occupational staffing patterns from the OES survey to base year industry employment (2008) totals to produce base year occupational level employment. Then, changes are made to the base year staffing pattern to reflect a projected staffing pattern for 2018. This modified staffing pattern is then applied to the previously projected industry employment levels to obtain projected occupational employment levels. This process is completed using the MicroMatrix system (a PC-based system which is developed through a grant from the DOL Employment and Training Administration).

b. The MicroMatrix system requires the following inputs:

i. Industry Employment Projections for a base and projected year
ii. Occupational Staffing patterns which identify the occupational makeup of a given industry
iii. National Occupational Technology Change Factors
iv. National Ratios for Self-Employed and Unpaid Family Workers
v. National Occupational Replacement Rates

c. BLS created the national occupational technology change factors through studies of current staffing patterns and emerging trends. The change factors represent a proxy for changes that occur because of new technology and changing business practices.

Concepts and Definitions

Following are definitions and concepts that may be helpful in understanding the projections data:

- NAICS Industry Code – North American Industry Classification System (NAICS) uses a six-digit hierarchical coding system to classify all economic activity into twenty industry sectors. Five sectors are mainly goods-producing sectors and 15 are entirely services-producing sectors. Additional information can be found at http://www.bls.gov/bls/naics.htm
- NAICS Industry Title – NAICS titles originate from the NAICS coding and are short descriptions of the industry sector.
- Occupational Code – A six-digit identifier for each occupation, occupations are aggregated up to a major occupational code, i.e. 11-0000 Management. Additional information can be found at http://www.bls.gov/soc/ .
- Occupational title – Titles are from the Standard Occupational Classification (SOC) system and are a short description of the job duties.
- Base Year Employment – The number estimated to be employed in that occupation or industry in the base year (currently 2008).
- Projected Year Employment – The number estimated to be employed in the projected year (currently 2018).
- Absolute Change – The level change in employment (absolute).
- Percent change – Simple percentage change from base year employment to projected year employment.
- Openings due to Growth – The openings in an occupation due to the expansion and/or creation of new businesses and the consequent need for additional workers.
- Total Openings – The number of job openings expected in an occupation due to growth plus replacement needs.
- Median Wage – The median wage for a given SOC occupation from the Kansas Wage Survey. Additional information can be found at http://www.dol.ks.gov/lmis/wagesurvey/ws2010/wagesurvey_2010.html
- Educational Requirement – The educational category that best describes the most significant source of education or training needed to become qualified (however, not the only method). Additional information can be found at http://www.bls.gov/emp/ep_data_education_training.htm

Note: As the OES survey identifies jobs by occupation, not employer, individuals who change employers, but stay in the same occupation, fall under the category of job turnover and are not included in the growth or openings measure. Also, replacement needs can be calculated from openings information by subtracting openings due to growth from total openings, those openings remaining are considered replacements.

Cautions When Using Estimates and Projections Data

Industry employment numbers are estimates from the QCEW and CES programs of the true level of jobs in an area. The OES survey is subject to error resulting from the sampling process and the rate of employer response to survey mailings. Employers may also have problems in completing and correctly identifying occupations on the survey.

Occupational projections are created using current and previous employment trends and serve to illustrate likely employment patterns in the future. Because of this uncertainty, there are assumptions that are made when creating projections. Some of these assumptions include:

- Neither current trends in immigration nor immigration law will change significantly
- No significant emergence of employment in new occupations that are not currently defined by the SOC
- There will not be a major war or event that either reallocates factors of production or decreases the amount of capital stock
- Social and educational patterns will continue
- Fluctuations in the business cycle will continue to occur
- Workplace laws and patterns will not change significantly, i.e. an unexpected change in the minimum wage or the average workweek significantly increasing or decreasing

The 2008 – 2018 Kansas projections use data from the Bureau of Labor Statistics for rates of replacement, future staffing pattern changes and personal income. For these inputs the 2008 – 2018 Kansas employment projections follow the same set of major assumptions used by BLS.

Other key points to consider when using occupational employment projections:

- OES data does not represent the number of individuals employed, it does represent the number of job positions; therefore, one person may be counted twice when holding two jobs.
- Employment data use the place-of-work concept and jobs are counted by the geographic area where the employer is located, not where the employee lives.
- Projected employment data does not portray seasonal fluctuations as they are annual averages.

For additional background material regarding industry and/or occupational estimates or projections, please visit the Bureau of Labor Statistics Web site: http://www.bls.gov/oco/oco2008.htm